**Shapran E.,
Sergienko O.,
Gaponenko O.,
Shapran O.**

INTEGRATED TOOL DEVELOPMENT FOR MANAGING A MARKETING ACTIVITY OF A TRADING ENTERPRISE IN A COMPETITIVE MARKET

Об'єктом дослідження є комплексний підхід формування маркетингової політики торгівельного підприємства для удосконалення ефективності маркетингової діяльності на конкурентному ринку. Представлений підхід складається з трьох основних етапів, а саме: оцінка та аналіз перспектив маркетингової діяльності підприємства, оцінка та аналіз внутрішнього та зовнішнього середовища, управління маркетинговою політикою підприємства.

Для оцінювання рівня привабливості сфери діяльності використана виробнича функція Кобба-Дугласа, на основі якої визначено ряд характеристик, що характеризують економічну привабливість галузей економіки. Найвищі показники за ефективністю функціонування мають сфера торгівлі, будівництво та фінансова діяльність.

В рамках дослідження чинників зовнішнього середовища побудовані моделі сегментації регіонів методом кластерного аналізу, що дозволяє ідентифікувати стійкі групи об'єктів зі схожими характеристиками. Сегментація дозволяє отримати однорідні групи регіонів України за ознаками: рівень розвитку, рівень інвестиційної привабливості, рівень економічної активності та потреба в оновленні побутової техніки. Результатом є отримані групи регіонів з високим, середнім та низьким рівнями розвитку. Застосовано методи дисперсійного аналізу для дослідження відмінностей товарного ринку за регіонами.

Для дослідження внутрішнього середовища реалізовано моделі динаміки продажу продукції та побудовано прогнози, що дозволяють розробити комплекс заходів, щодо поліпшення політики продажів підприємства. Для оцінки та прогнозування рівня обсягів продажу товарів були використані моделі декомпозиції часового ряду з виділенням складових: трендово-циклічна, сезонна і випадкова. Використана модель управління товарними запасами для удосконалення управління збутовою політикою адаптована до торгівельного підприємства на основі використання проміжних результатів планування, а саме: темпи попиту, витрати на замовлення й зберігання, час виконання замовлення.

Реалізовано метод аналізу ієрархій на основі експертного опитування щодо формування напрямів політики просування. Отримані першочергові заходи застосування коштів маркетингового бюджету, які повинні бути направлені в першу чергу на розробку та реалізацію дієвих маркетингових заходів з: просування та стимулювання збуту, реклами, особистих продажів та зв'язків із громадськістю. Результати можуть бути впроваджені в діяльності торгових підприємств для формування та обґрунтування маркетингової політики розвитку.

Ключові слова: *маркетингова діяльність, маркетингова політика, внутрішнє та зовнішнє середовище, сегмент ринку, стратегія управління.*

1. Introduction

The use of marketing contributes to the dynamic development of scientific and technological progress, production and trade, relieves excess tension in the market and thus introduces a certain orderliness in the functioning of market competition. Enterprises that use modern marketing technologies, as a rule, are better organized, more competitive, suffer less losses from changes in market conditions and the environment [1].

Commercial activity is directly related to the complex of marketing operations for the implementation of the exchange of inventory holdings that ensure the sale and purchase of goods in order to meet the demand of the population for goods and services. The basis of this activity, first of all, is a deep study and knowledge of the market, the potential of competitors, the competitiveness of goods and foresight. A promising approach to improving the effectiveness of marketing policies at the enterprise is the need to take into account a large number of influence factors, such as: the use of modern tools for analyzing activities and predicting future sales of marketable products [2].

Consequently, under the current realities of the Ukrainian economy market, it is urgent to consider the problem

of modeling marketing strategies of trading enterprises developing in harsh conditions of market competition. That is why, the relevance of assessing and analyzing the marketing activities of an enterprise is applied in nature and is the main factor in the development of practical recommendations on the strategy of enterprise behavior in a competitive market.

2. The object of research and its technological audit

One of the most problematic places is the lack of available methodological developments for a diagnostic integrated study of the marketing activities of enterprises, which allows to investigate the cause-effect relationships of problem and crisis situations. And also to give an objective assessment of the effectiveness of the enterprise marketing process in line with the systematic nature of the current conditions of the internal and external environment, and identify potential opportunities and threats to the development of the enterprise.

Therefore, *the object of research* is a comprehensive approach to the formation of the marketing policy of a trading company to improve the effectiveness of marketing activities.

3. The aim and objectives of research

The aim of research is improvement of the management of the marketing activities of a trading enterprise by developing a comprehensive algorithm for assessing and analyzing the marketing activities of an enterprise in a competitive market.

To achieve this aim, the following objectives are set:

1. To assess the attractiveness of the market and analyze the prospects of marketing activities of the enterprise.

2. To build regional segmentation models for various groups of indicators.

3. To analyze identified segments of the market for commodity products by groups of indicators of the needs of the population in updating household appliances.

4. To assess and obtain forecasts of sales volumes of the investigated goods.

5. To prove the effectiveness of the proposed ways to improve the marketing management policy at the enterprise.

4. Research of existing solutions of the problem

Among the studies identified in the resources of the scientific literature can be highlighted the work devoted to the main directions of solving the problem on:

– development of a complex of marketing activities of the enterprise [3];

– marketing management mechanisms [4];

– improving the marketing policy of product promotion [5].

However, their attention is mainly focused on the orientation of the company's management in the market, based on strategic principles.

The author of [6] shows in detail the conceptual approach to strategic management of the development of marketing activities of an industrial enterprise. So, for the possibility of applying the concept of strategic management

of the development of marketing activities of an industrial enterprise in practice, an appropriate methodology has been developed for the formation of marketing strategies of an industrial enterprise, based on the achievements of the theory of fuzzy sets. However, the question remains of taking into account a quantitative assessment of the influence of factors of the external and internal environment on marketing activities and taking into account the specifics of the activity of production and trading systems.

As indicated in [7, 8], it is necessary to apply a component approach to the analysis of the internal and external environment of the enterprise. However, the complex nature and diversity of factor accounting require improved approaches to the management of marketing activities and policies. This will allow not only to realize its role in the development of the enterprise, but first of all to assess the direction and effectiveness of the marketing activities of the enterprise.

So, according to the author of [9, 10], the significant advantages of economic and mathematical models for analyzing the effectiveness of marketing activities is a formal description of the relationships between economic variables (marketing costs and the effectiveness of marketing activities); providing accurate information on the effectiveness of marketing activities and marketing activities in general. As well as providing opportunities to predict the assessment of the effectiveness of marketing activities in the future. This confirms the need to use the economic and mathematical apparatus in the process of assessing and analyzing the marketing activities of an enterprise.

Another solution to the problem described in [11] does not provide for the construction of an analysis of the effectiveness of marketing activities and its adjustment in accordance with the needs of the market and consumers' own capabilities. Although the entire set of business processes and organizational processes, their functions and tasks are considered.

An alternative approach is shown in [12, 13], which emphasized the need and possibility of using elements of the product policy for the development of an enterprise through a new product and explored the needs of consumers. However, the described parameters do not have actual evidence and recommendations for taking into account many factors of influence, such as: the use of modern tools for analyzing activities and forecasting future sales volumes of commodity products.

These areas of research are disclosed in [13, 14], where an analysis of aspects of inventory management in retail chains is carried out, emphasizes the existing probabilities of inaccuracies in the implementation of elements/directions of marketing policy.

Thus, the analysis results allow to conclude that the main idea of marketing policy is based on knowledge of the needs of specific consumer groups. That is why the main task of developing an approach to managing a marketing policy is to choose one or another market segment in which it can hold a position for a long time, and to form a target market for its products.

5. Methods of research

The next research methods are used:

– econometric methods (time series decomposition models) for predicting sales volumes of goods;

– methods of economic and statistical research (cluster and analysis of variance) for assessment and analysis of market segments;

– decision-making methods (hierarchy analysis method) to improve the marketing policy of promotion.

The calculations are carried out using the Microsoft Excel spreadsheet processor, Statistica and Eviews application software packages.

6. Research results

The effectiveness of sales, investment and financial activities of the enterprise is expressed in the achieved financial results. To improve the financial condition of the enterprise, a clear management of the marketing activities of the enterprise is necessary, the general model of the management system of which is shown in Fig. 1.

In the system in Fig. 1:

– X_n – inputs to the system, that is, the resource potential (financial, labor, innovative, investment capital, organizational and management, information);

– Y_n – represents the outputs of the system, that is, the marketing policy, which is formed as a result of analysis, research and calculations, conducts marketing service at the enterprise;

– Z_n – the target function of marketing activities (the goal of which the company seeks to achieve as a result of the implementation of marketing activities);

– MA – management actions (actions of specialists leading to acceleration or inhibition of the process of developing a marketing policy);

– F – feedbacks that signal the effectiveness of marketing activities;

– R – restriction (available opportunities for enterprise development, limited resources);

– EF – exciting factors, which can be government policy, actions of competitors, position in the domestic and foreign markets.

The last factor that affects the marketing activity is external disturbances and counteractions (ς). That is, uncontrolled interference of the external environment, causing failures and lead to a worsening of the situation.

The purpose of marketing activity is the formation of an effective marketing policy of the enterprise. For this, a complex of models of marketing activities of the enterprise is proposed, which consists of three main stages. A comprehensive method for assessing and analyzing the marketing activities of an enterprise is shown in Fig. 2.

The main stages of the proposed integrated research algorithm:

Stage 1. Assessment and analysis of the prospects of marketing activities of the enterprise. At the first stage, an assessment and analysis of the prospects of marketing activities of the enterprise is carried out. Using the Cobb-Douglas production function, an analysis of the attrac-

tiveness of the scope of the enterprise, i. e. trade industry. Assessing the investment attractiveness and development of the region, a conclusion is drawn on the prospects of work in this sector of the economy. Also at this stage, an assessment of the financial and economic condition of the enterprise is carried out to obtain information on the efficiency of the enterprise. Having calculated the values of the liquidity and profitability ratios and comparing them with the normative values, a conclusion is drawn about the financial condition of the enterprise and its development trends.
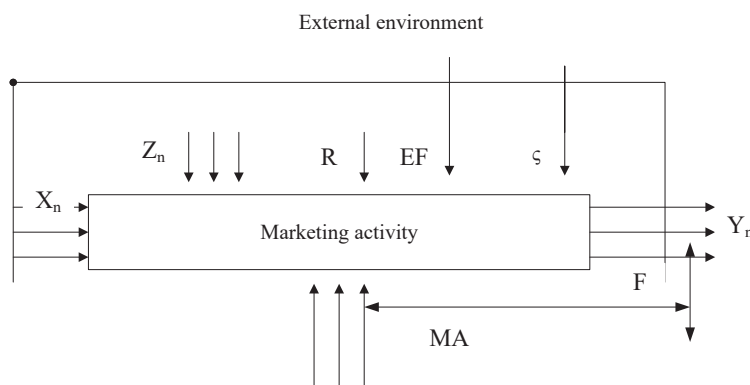

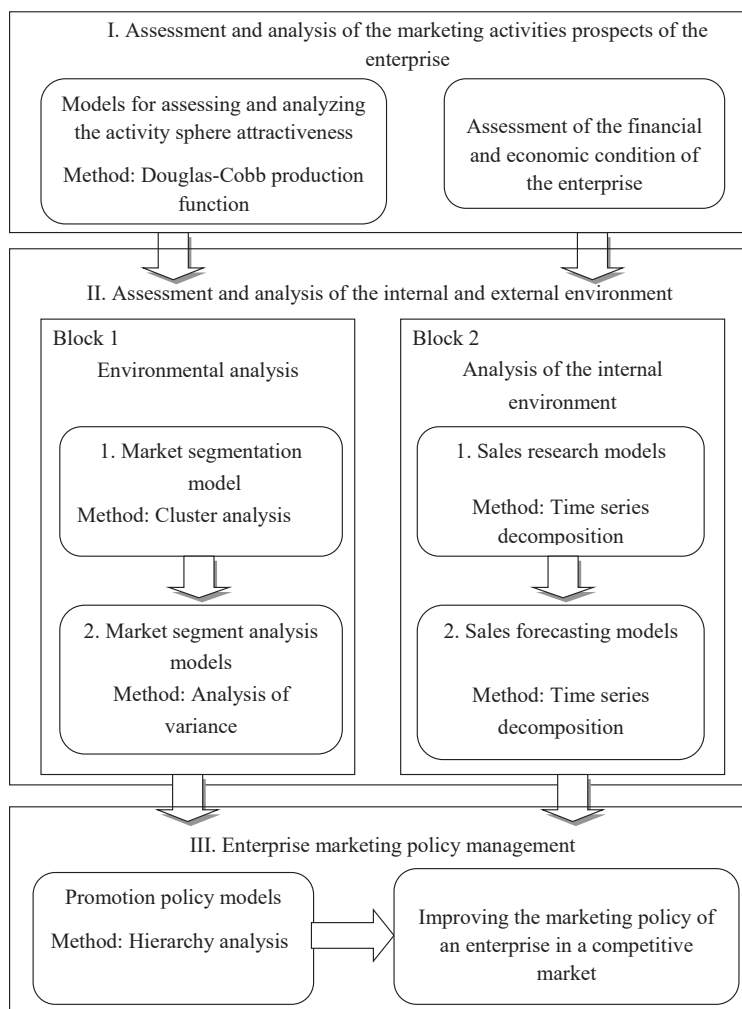**Fig. 1.** Marketing activity management system

Fig. 2. Comprehensive approach for assessing and analyzing the enterprise's marketing activities

To build the model, the Cobb-Douglas production function is used [15]. The Cobb-Douglas production function has the form:

$$Y = a_0 X1^{a1} \cdot X2^{a2} e^{rt}, \qquad (1)$$

where Y – gross value added (GVA) by type of economic activity (million c. u.); $X1$ – fixed assets by types of economic activity (million c. u.); $X2$ – the number of employed population by type of economic activity (million people) [15]; a_0, a_1, a_2 – model assessed parameters; e^{rt} – factor characterizing scientific and technological progress (STP), where the parameter r $(r > 0)$ characterizes the growth rate of output taking into account the influence of STP.

To construct and comprehensively analyze the multiple nonlinear econometric model [16, 17], the Eviews application package [18] is used. The quality of the obtained models is estimated using the correlation coefficient R, the coefficient of determination d. The results of quality assessment of the obtained models are presented in Table 1.

Table 1

Model adequacy analysis (Eviews)

Weighted model adequacy statistics			
R-squared	0.999775	Mean dependent var	15.07991
Adjusted R-squared	0.999721	S.D. dependent var	7.490174
S.E. of regression	0.125045	Sum squared resid	1.125817
F-criteration	159628.6	Durbin-Watson stat	1.856345
(Prob (F-criteration))	0.000000	–	–

The results of the assessment of the model parameters in 2013–2018 according to the State Statistics Service of Ukraine [19] are given in Table 2.

As can be seen from the Table 2, the elasticity of output by labor costs $a_1 = 0.245$ and the elasticity of output by volume of production assets $a_2 = 0.578$. Thus, the model has the following form:

$$Y = a_{0i} \cdot X1^{0.245} \cdot X2^{0.578} \cdot e^{0.13t}. \qquad (2)$$

The graph of fixed effects (a_i) [16, 17] is shown in Fig. 3, confirms the attractiveness of the sphere of trade and financial activity as the most attractive.

Fig. 4 shows a graph of the dynamics of changes in the average labor productivity of the trade sector.

The highest indicators are in the areas of trade and financial activity, that is, these industries have the highest indicator of the number of products per unit of expended labor.

The graph of the results of calculating the average capital productivity by types of economic activity is presented in Fig. 5.

The highest average return on assets are in the areas of trade, financial activity and construction. Thus, the trading industry provides the largest volume of production per unit of used production assets.

Table 2

Parameters of the production function model by type of economic activity

| Variables	Coefficients	–
X1?	0.245060	–
X2?	0.578991	–
T?	0.136406	–
Fixed effects	–	a_{0i}
_E1--C	3.156355	23.4848375
_E2--C	1.849092	6.354047427
_E3--C	0.825634	2.283327936
_E4--C	2.327085	10.24802496
_E5--C	3.315840	27.54552251
_E6--C	2.395510	10.97379327
_E7--C	3.169792	23.80253291
_E8--C	3.806068	44.97325591
_E9--C	1.923032	6.841671
_E10--C	3.028910	20.6746849
_E11--C	3.901945	49.49863038
_E12--C	2.267277	9.653079658
_E13--C	2.925866	18.65037028
_E14--C	2.758876	15.7820939
_E15--C	2.665149	14.37009053
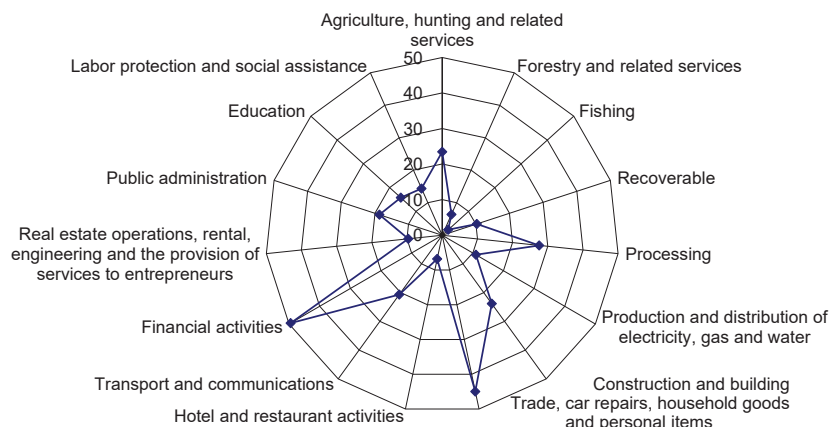
Fig. 3. Graph of fixed effects by spheres of activity

Fig. 4. The graph of the average labor productivity in the trade sphere (based on own calculations according to Ukrstat [19])
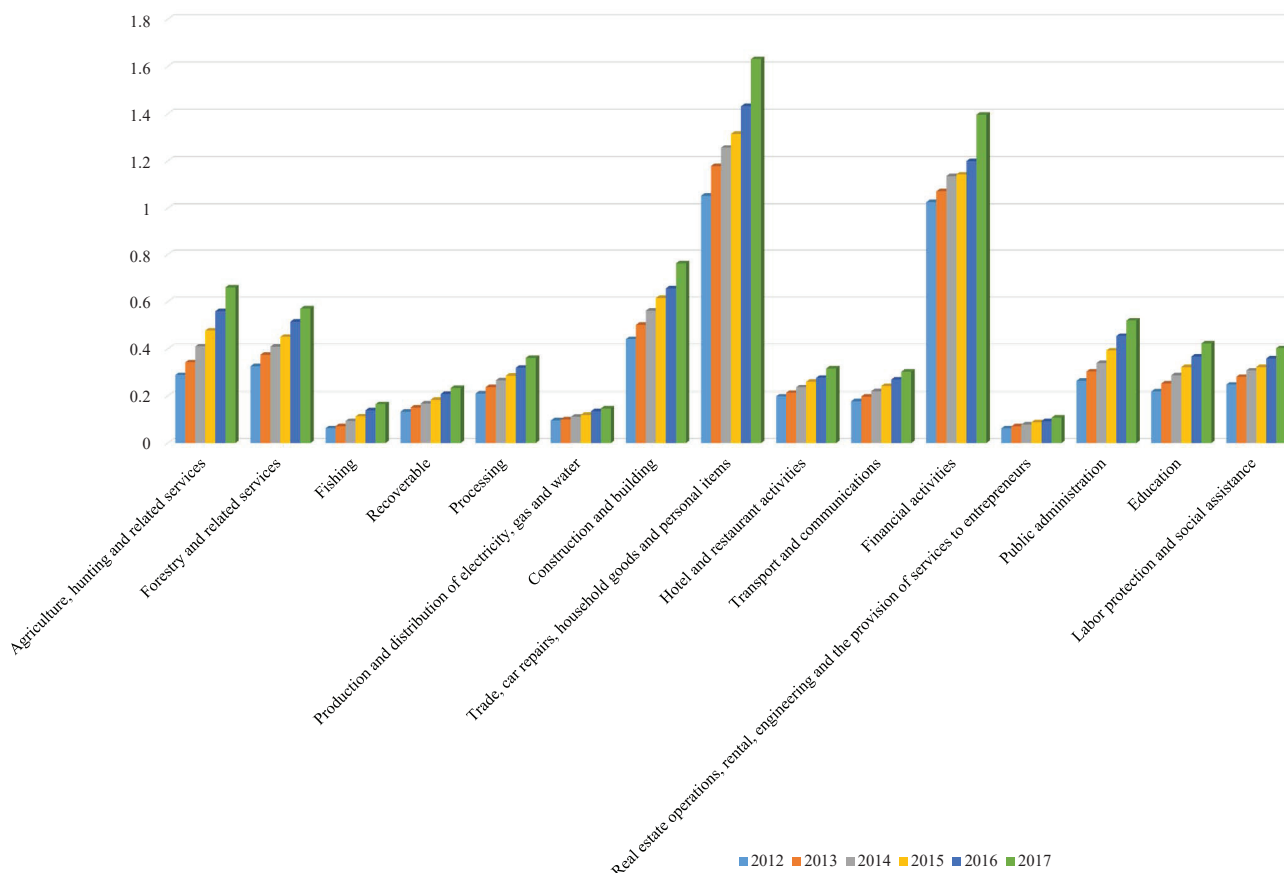
Fig. 5. The average return on assets by type of economic activity (based on own calculations according to Ukrstat [19])

Stage 2. Assessment and analysis of the internal and external environment. Within this stage, two blocks are presented: analysis of the external and analysis of the internal environment. The analysis of the external environment is an integral stage of marketing research of the market. To ensure the competitiveness of the enterprise, it is necessary to analyze the external factors affecting its functioning and development.

At the stage of analysis of the external environment, market segmentation and analysis of the selected segments are carried out. It is proposed to segment the regions of Ukraine according to different groups of indicators, selected depending on the area of activity of the enterprise. For this, cluster analysis [20] is used in the Statistica SPP [21, 22]. This method allows to clearly assign regions to specific clusters and give each of these clusters a complete description.

Cluster analysis in marketing research helps to solve the following problems:
1) segmentation;
2) analysis of consumer behavior;
3) positioning;
4) choice of test markets.

As a result of clustering, the obtained groupings of regions by the following groups of indicators:
1) according to indicators of the development level of the region (average monthly salary per one full-time employee; gross regional product per person; retail turnover; disposable income per person);
2) according to indicators of investment attractiveness (export; import; volumes of direct foreign investments in Ukraine; investments in fixed assets by region);

3) according to indicators of economic activity (employed population; unemployed population per 1 person; marriages per 1 person);
4) according to terms of the provision of the population with durable goods per 100 families (demand) (televisions, refrigerator, washing machines).

As a result of clustering, the obtained groupings of regions by the following groups of indicators:
1) according to indicators of the development level of the region (average monthly salary per one full-time employee – X1; gross regional product per person – X2; retail turnover – X3; disposable income per person – X4);
2) according to indicators of investment attractiveness (export – X5; import – X6; volumes of direct foreign investments in Ukraine – X7; investments in fixed assets by region – X8);
3) according to indicators of economic activity (employed population – X9; unemployed population per 1 person – X10; marriages per 1 person – X11);
4) according to terms of the provision of the population with durable goods per 100 families (demand) (televisions – X12, refrigerator – X13, washing machines – X10).

The graphs of the average values of the studied indicators by groups for the selected state clusters are presented in Fig. 6.

The consolidated results of the clustering of Ukrainian regions in terms of the attractiveness of market segments are presented in Table 3. The results of regional segmentation are necessary to assess the attractiveness of segments with the subsequent selection of one or more target segments of promising activities.
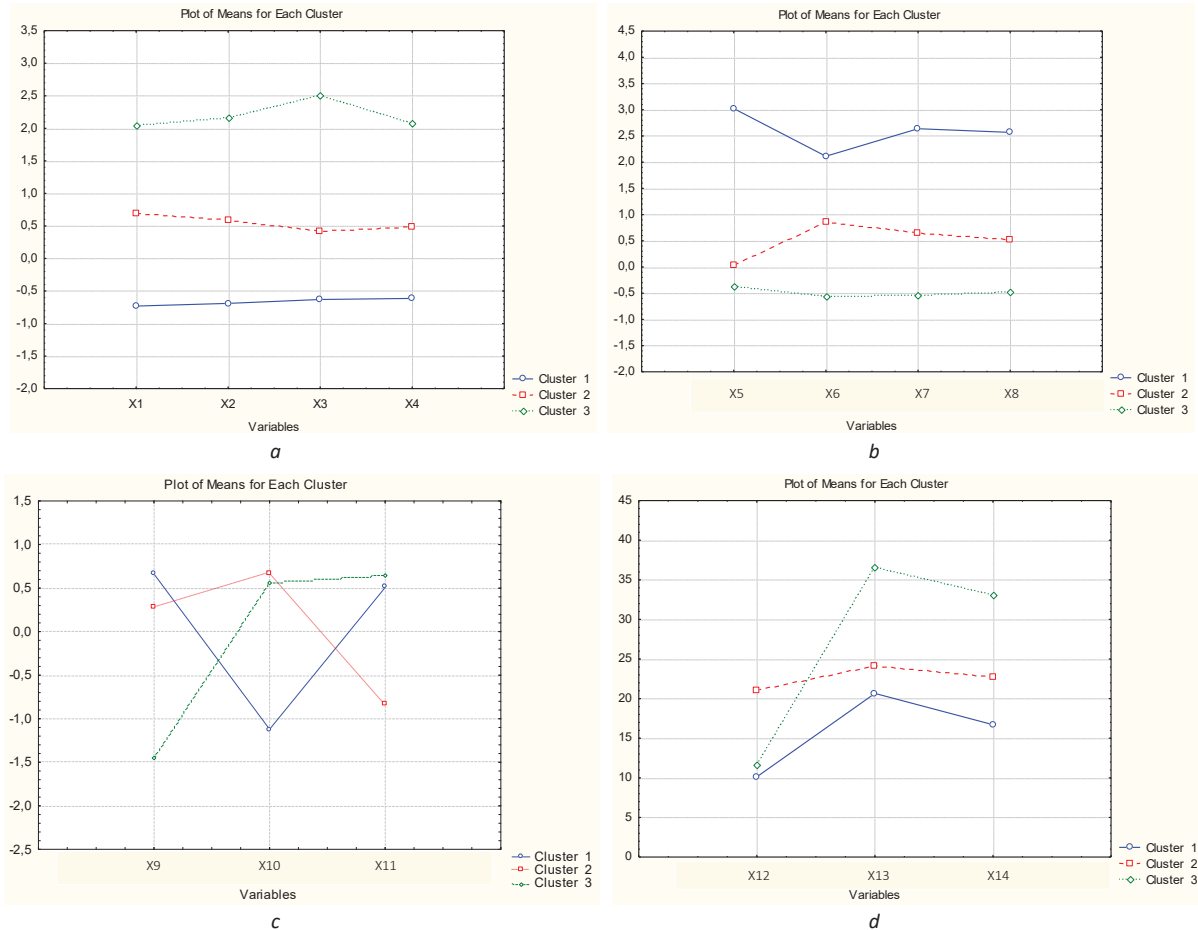
Fig. 6. Graphs of the average values of the studied indicators by groups for the selected state clusters (Cluster 1 – blue line, Cluster 2 – red line, Cluster 3 – green line): *a* – indicators of the development level of the region; *b* – indicators of investment attractiveness; *c* – indicators of economic activity; *d* – indicators of the security of the population with durable goods per 100 families (demand)

Table 3

Characteristics of Ukraine's regions by indicators of attractive market segments

Regions	Development level	Level of investment attractiveness	Level of economic activity	Provision of household appliances
Vinnytsia	Low	Low	High employment level	Low
Volyn	Low	Low	High level of registered marriages	Low
Dnipropetrovsk	High	High	High employment level	Average
Donetsk*	High	High	High employment level	Average
Zhytomyr	Low	Low	High unemployment level	High
Zakarpattia	Low	Low	High employment level	Low
Zaporizhzhia	Average	Average	High employment level	Average
Ivano-Frankivsk	Low	Low	High level of registered marriages	Low
Kyiv	Average	Average	High employment level	Average
Kirovohrad	Low	Low	High employment level	Low
Luhansk*	Average	Low	High unemployment level	Low
Lviv	Average	Average	High level of registered marriages	Average
Mykolaiv	Average	Low	High unemployment level	Low
Odesa	Average	Average	High employment level	Low
Poltava	Average	Average	High unemployment level	Average
Rivne	Low	Low	High level of registered marriages	High
Sumy	Low	Low	High unemployment level	Average
Ternopil	Low	Low	High level of registered marriages	Low
Kharkiv	Average	Average	High employment level	Average
Kherson	Low	Low	High unemployment level	Average
Khmelnytskyi	Low	Low	High unemployment level	Low
Cherkasy	Low	Low	High unemployment level	Low
Chernivtsi	Low	Low	High level of registered marriages	Low
Chernihiv	Low	Low	High unemployment level	Low

Note: * – excluding temporarily occupied territories

Further analysis involves the study of the degree of influence between separate groups of indicators using analysis of variance methods [21–23]. The purpose of the analysis of variance is the analysis of market segments and the selection of the target segment to expand the distribution network. The analysis of variance is based on the assumption that some variables can be considered as causes (independent variables) and others as consequences (dependent variables). For the first experiment, the following dependence is considered. The dependent variables are: $X12$ – the need for updating the TV; $X13$ – the need for updating refrigerator; $X14$ – the need for updating washing machines. As an independent variable, the level of development of the region.

The graph of averages for the studied variables is presented in Fig. 7.

Thus, the results show that the need for updating TVs is much higher in regions with a high and medium level of development, and low in regions with a low level of development.

The result of the implementation of the analysis of variance analysis methodology is the interconnection of indicators: the development level, investment attractiveness, economic activity and the need for updating household appliances, shown in Fig. 8.
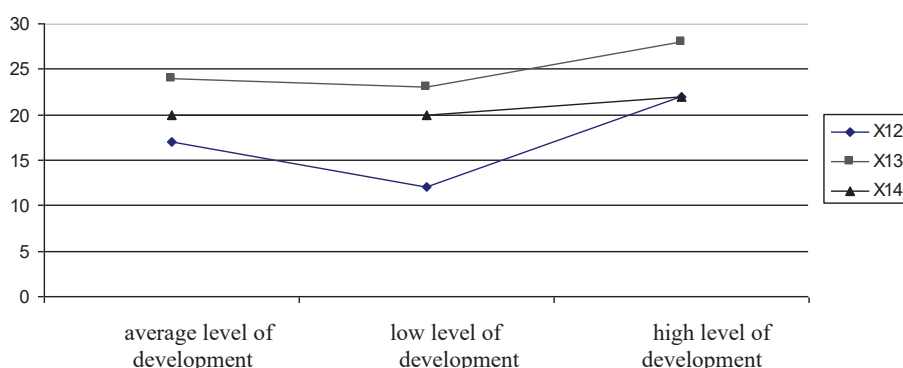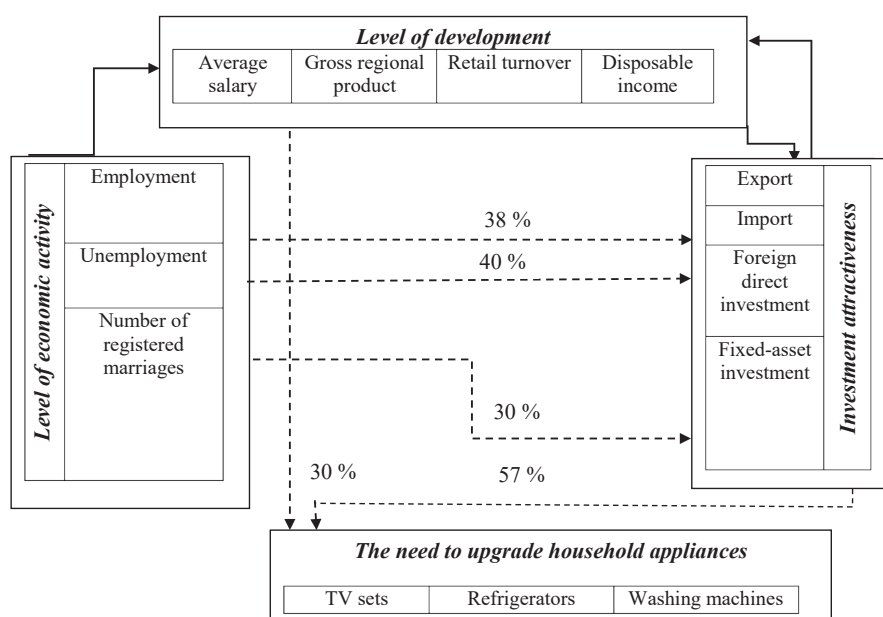
According to the group of indicators, «development level of the region» – average monthly salary, gross regional product, retail turnover and disposable income – it is possible to conclude that the overall level of development affects the supply of televisions and refrigerators.

As can be seen from the results of analysis of variance in Fig. 8, the availability of TVs is greater, the higher the level of development of the region, namely in regions with a high and medium level of development:

– Dnipropetrovsk region;
– Donetsk region;
– Zaporizhzhia region;
– Kyiv region;
– Luhansk region;
– Lviv region;
– Nikolaevkskaya area;
– Odesa region;
– Poltava region;
– Kharkiv region.

High availability of refrigerators is observed in regions with a high level of development.

In regions with a low level of development, it would be advisable to conduct a policy of concentration on cheap goods that will be in demand. Particular attention should be paid to the offer of a wide range of inexpensive televisions, since in our time, almost every family wants to have more than one, but more. This need can be met by offering cheaper models that most people in low-development regions can afford.

According to the group of indicators «investment attractiveness of the region» – export, import, foreign direct investment and fixed capital investment – it is possible to conclude that these indicators directly affect the level of provision of household appliances. Basically, there is a difference in the level of provision of televisions and refrigerators. The least provision with TVs is observed in regions with a low level of investment attractiveness, and the most provision with refrigerators is observed in regions with a high level of investment attractiveness.

The impact of the indicator «economic activity of the population» on the need for updating household appliances is assessed, which confirms the hypothesis regarding the relationship. So, the need for updating household appliances does not depend on the level of economic activity of the population. It is proved that an important indicator is the level of investment attractiveness since it

Fig. 7. Graph of averages for the studied variables

Fig. 8. Scheme of the indicators' relationship according to the variance analysis results

directly affects the level of need for updating household appliances.

The next block in the second stage is the analysis of the internal environment. This block provides for the implementation of the following models: sales forecasting models and inventory management models. Using an econometric model of time series decomposition, a forecast of sales volumes for the next period is formed, and the trend of sales activity is determined on the basis of the following components: absolute trend (trend), cyclical component, seasonal component, random component [24].

Analysis of competitors shows that the stores presented a wide range of household appliances of leading brands [25]. In the framework of this study, it is impossible to cover all types of goods, therefore, priority types of household appliances were selected for analysis and research:

– TVs belonging to the class of audio-video equipment;
– refrigerators related to long-term use technology.

Based on the data on the dynamics of sales volumes for the three brands that are most in demand among buyers – refrigerators (LG, Samsung, NORD), let's make forecasts. The graphs of the output data are presented in Fig. 9.

As a result of the calculations, the value of the average absolute percentage error for each model is obtained [24] (Table 4).

The graph of the forecast and initial values of sales of refrigerators by brand is shown in Fig. 10.

Table 4

The results of the forecasting models adequacy

Model	Mean absolute percentage error (m.a.p.e.)
Model 1 (LG refrigerators)	9 %
Model 2 (Samsung refrigerators)	16 %
Model 3 (Nord refrigerators)	11 %

Stage 3. Management of the marketing policy of the enterprise. In the framework of the third stage, applying the method of hierarchy analysis [26], a promotion policy is formed, based on a combination of various methods, the main directions of a promotion policy are determined to increase sales indicators and improve the financial condition of the enterprise [10, 27]. The goal is the choice of an enterprise promotion strategy. Among the promotion methods in the work, four main ones are considered:

1. Advertising – any paid form of non-personal presentation and promotion of ideas, goods and services, carried out by a specific customer.

2. Sales promotion – short-term incentive measures that promote the sale or sale of products or services.

3. Personal sales – an oral presentation of a product with the aim of selling it in a conversation with one or more potential customers.

4. Public relations (PR) – creating good relations with the public, having contacts with the organization, by creating a favorable image of the organization and its products and by neutralizing adverse events and rumors.
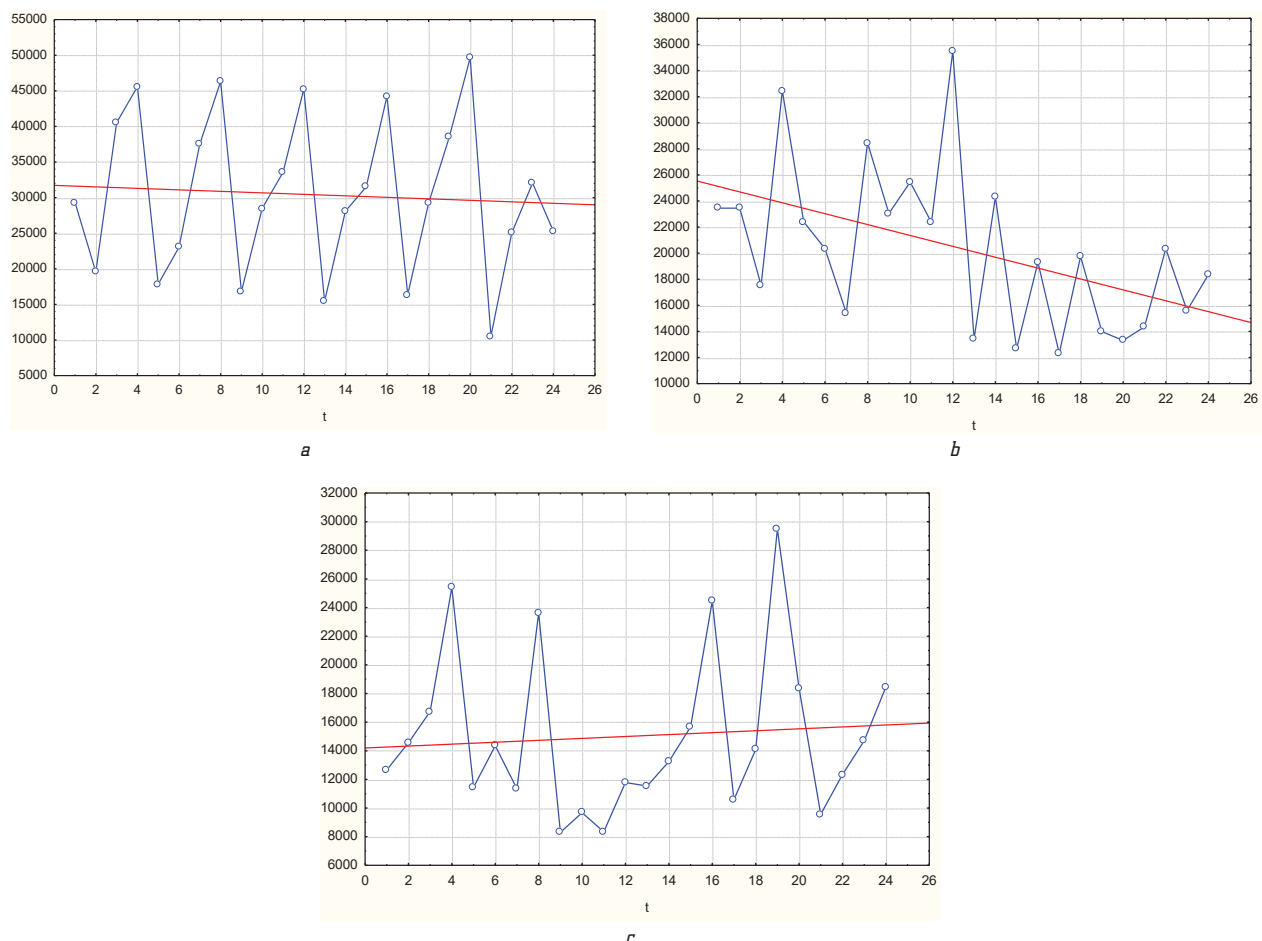

Fig. 9. Graphs of the output data of sales volumes by types of goods: *a* – LG; *b* – Samsung; *c* – NORD
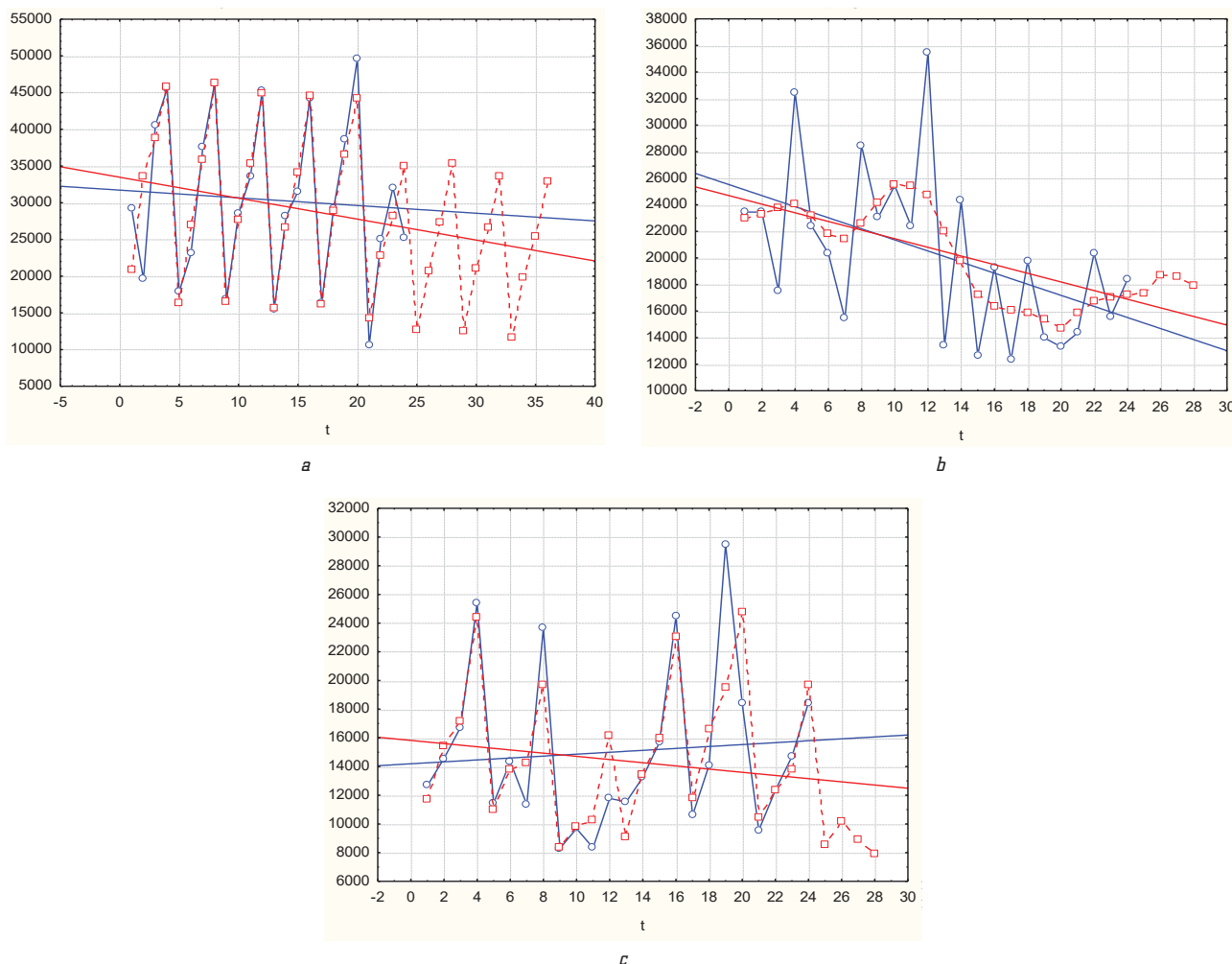
Fig. 10. The graph of Output and forecast values of goods sales volumes (output values — blue line, Forecast values — red line):
a — LG; *b* — Samsung; *c* — NORD

To implement the methodology, it is necessary to formulate a system of criteria and alternatives; the following criteria are selected in the work, according to which the best alternative is selected:

– type of consumer;
– type of product;
– market segment, the company occupies;
– financial resources of the enterprise;
– popularity level of the product.

And also alternatives have been formed, among which it is necessary to choose the best: advertising; sales promotion; personal sale; Public Relations.

The results of the synthesis of alternatives are performed in the Expert Choice package [28] and are presented in Fig. 11.

As a result of the work, it is possible to conclude that, first of all, the enterprise needs to spend money from the promotion budget on sales promotion (about 60 %). After analyzing the existing methods of sales promotion [13, 25], it is possible to determine the methods that will be most effective for trade enterprises:

1) providing discounts to regular customers;
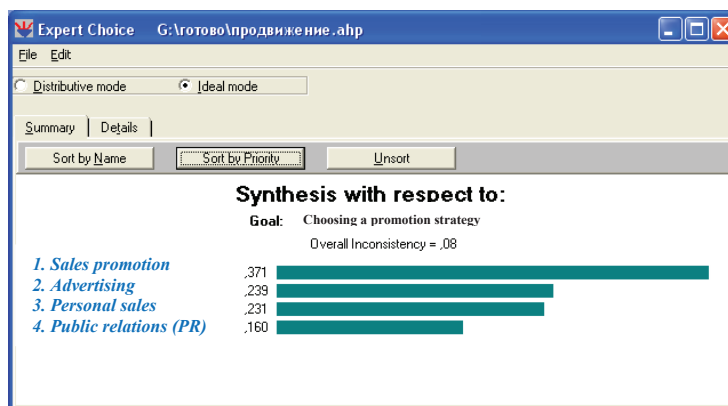2) gifts;
3) souvenirs.

Fig. 11. Window for the synthesis of alternatives by promotion methods (Expert Choice)

Typically, organizations share several methods for promoting products. Fig. 12 shows the charts of the output and forecast sales volumes of LG refrigerators using only sales promotion methods and an integrated approach using advertising (long-term effect) and sales promotion (short-term effect). So, an advertising campaign stimulates an increase in sales, creates the conditions for attracting new consumers, switching them to the goods of the advertised brand. Reinforcing the results of advertising by using

appropriate methods of sales promotion increases sales. This effect is observed for most goods and services. As a result, the priority measures are obtained for the use of marketing budget funds, which should be aimed primarily at the development and implementation of effective marketing measures to promote and stimulate sales, advertising, personal sales and public relations.
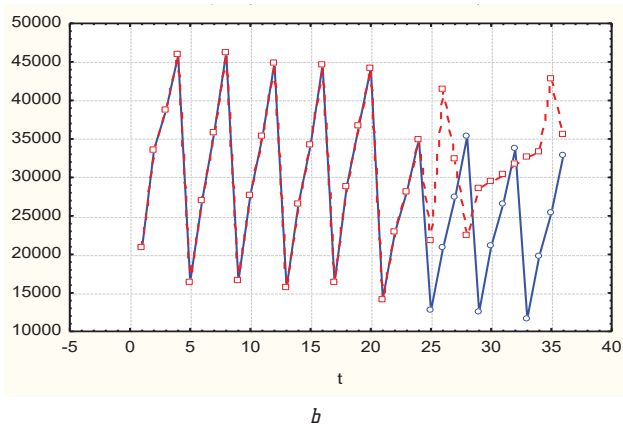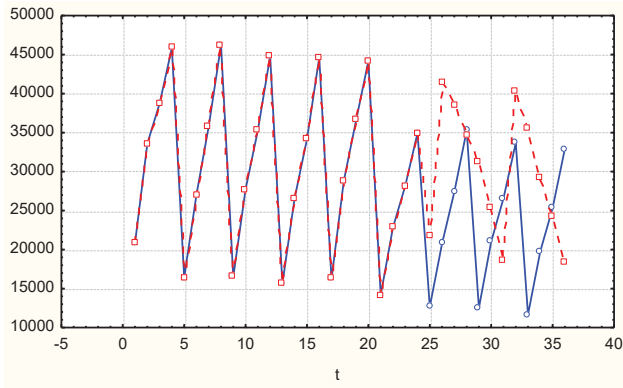

Fig. 12. Graph of output and forecast values of sales volumes of LG brand refrigerators (Output values – blue line, Forecast values – red line): *a* – using sales promotion methods; *b* – based on an integrated approach using advertising

The final step of marketing activity is the implementation of the main decisions that will shape the marketing policy of the enterprise, as well as the further direction of the enterprise's development.

Prospects for further research are scenario modeling and assessment of the effectiveness of the logistics marketing department of the enterprise.

7. SWOT analysis of research results

Strengths. The strengths of research are associated with the use of a comprehensive analytical methodology for assessing factors of the internal and external environment and development prospects. Important aspects of solving the problems of improving marketing policy are the assessment and forecasting of the level of sales of goods, the targeted management of inventory at a trading company.

Weaknesses. The complex nature and versatility of using economic and mathematical tools requires the use of a large database of statistical data, the collection and processing of which requires enough time and the use of modeling software. This requires knowledge of modern information technology and application software packages.

Opportunities. The proposed toolkit consists of three aggregated complex stages of assessing and analyzing the prospects of marketing activities of the enterprise, its internal and external environment. The results obtained with a comprehensive aggregated approach to the formation of the marketing policy of a trade enterprise can be implemented in the activities of trade enterprises to formulate and justify a marketing development policy.

Threats. Since the proposed algorithm and model basis for studying the effectiveness of marketing policies at the enterprise requires taking into account a large number of influence factors to predict future sales of marketable products, it is therefore necessary to take into account the impact of various risks of the external and internal environment. This involves continuous monitoring of the state, that is, assessing potential opportunities (both internal and external) to neutralize and generalize negative situations. The application of the model basis also provides for the availability of appropriate software and skills in these programs.

8. Conclusions

1. The assessment of the attractiveness level of the field of activity is done based on the use of the Cobb-Douglas production function. Based on the calculations, the field of trade and financial activities are the most attractive areas of activity, that is, the field of trade is popular and profitable in our time. Also, based on the Cobb-Douglas production function, a number of characteristics ware determined that characterize the economic attractiveness of economic sectors. The construction of the production function and the calculation of its main characteristics makes it possible to assess the attractiveness of the scope of the enterprise.

2. Using the clustering methods, segmentation of Ukrainian regions by groups of indicators is carried out. For a clear segmentation of the goods market, the method of k-means of statistical multivariate analysis is used, which allows identifying stable groups, each of which combines objects with similar characteristics. Based on segmentation, certain groups according to the development level of Ukrainian regions with high, medium and low levels of development and investment attractiveness.

3. The analysis of segments of the commodity market using the methodology of analysis of variance, which allows to investigate the dependence of quantitative and qualitative features. According to calculations, it is proved that the level of investment attractiveness is an important indicator, since it directly affects the level of the population's need for updating household appliances.

4. It is proved that an important aspect of solving problems of improving marketing policy is the assessment and forecasting of the level of sales of goods. To assess and predict the level of sales of goods, time-series decomposition models with the identification of components used: trend-cyclic, seasonal, and random. The quality and adequacy of forecasting models were assessed by the criterion of the average percentage absolute error, certain best models are determined. As a result, graphs of forecast values of sales volumes of goods is built in a quarterly context.

5. It is shown that the chosen strategic direction for the promotion of products is the final stage in the formation and improvement of the internal marketing policy of the enterprise. This direction is based on the use of the method of analysis of hierarchies and expert assessments.

References

1. Krasnokutska, N. S., Bubenets, I. H., Chatchenko, O. Ye (2015). *Pidpryiemnytskyi potentsial yak faktor rozvytku torhovelnykh pidpryiemstv*. Kharkiv: Lider, 175.
2. Smovzhenko, T. S., Azarenkova, G. M. et. al.; Kuznecova, A. Ia. (Ed.) (2014). *Sovremennoe sostoianie i problemy razvitiia biznesa*. Kyiv: UBS NBU, 306.
3. Backman, S. J. (1998). Chapter 12. Marketing. *Activities, Adaptation & Aging, 23 (3),* 175–191. doi: http://doi.org/10.1300/j016v23n03_03
4. Brumnik, R., Klebanova, T., Guryanova, L., Sergienko, O., Kavun, S., Nepomnyaschiy, V. (2014). Synthesis of Systems Modeling for Early Crisis Forecasting and Prevention. *European Journal of Scientific Research, 118 (1),* 7–22.
5. Panchuk, A. S. (2009). Kompleksna systema stratehichnoho marketynhovoho upravlinnia komertsiinoiu diialnistiu pidpryiemstv. *Visnyk Donetskoho natsionalnoho universytetu ekonomiky i torhivli imeni Mykhaila Tuhan-Baranovskoho. Seriia «Ekonomichni nauky», 4 (36),* 89–93.
6. Raiko, D. V. (2008). *Stratehichne upravlinnia rozvytkom marketynhovoi diialnosti: metodolohiia ta orhanizatsiia*. Kharkiv: INZhEK, 632.
7. Gorbunko, L. I. (2008). Analiz vnutrennei i vneshnei sredy organizacii: komponentnii podkhod. *Sbornik nauchnykh trudov SevKavGTU. Seriia «Ekonomika», 7,* 47–49.
8. Sergienko, O., Shapran, E., Gaponenko, O.; Bezpartochnyi, M., Britchenko, I. (Eds.) (2018). Spatial dynamics diagnostic models of enterprise external environment. *Management of innovative development the economic entities. Vol. 2.* Przeworsk: Wydawnictwo i Drukarnia NOVA SANDEC, 121–134.
9. Lukan, O. M. (2014). Analiz efektyvnosti marketynhovoi diialnosti pidpryiemstva. *Visnyk Kyivskoho natsionalnoho torhovelno-ekonomichnoho universytetu, 5,* 42–52.
10. Malyarets, L. M., Babenko, V. O., Nazarenko, O. V., Ryzhikova, N. I. (2019). The Modeling of Multicriteria Assessment Activity in Enterprise Management. *International Journal of Supply Chain Management, 8 (4),* 997–1004.
11. McDonald, M., Mouncey, P. (2009). *Marketing accountability: how to measure marketing effectiveness*. London and Philadelphia: Kogan Page, 294.
12. Rise, C. (1997). *Understanding Customers*. Oxford: Butterworth Heinemann.
13. Matviienko-Biliaieva, H. L. (2016). Systematyzatsiia analitychnykh zadach za osnovnymy vydamy lohistychnoi diialnosti pidpryiemstva. *Naukovyi visnyk Uzhhorodskoho natsionalnoho universytetu, 6,* 85–88.
14. Shtal, T., Buriak, M., Amirbekuly, Y., Ukubassova, G., Kaskin, T., Toiboldinova, Z. (2018). Methods of analysis of the external environment of business activities. *Espacios, 39 (12),* 22.
15. Hurianova, L. S., Klebanova, T. S., Serhiienko, O. A. (2015). *Ekonometryka*. Kharkiv, 384.
16. Hurianova, L. S., Klebanova, T. S., Prokopovych, S. V. et. al. (2016). *Prykladna ekonometryka. Chastyna 1*. Kharkiv: KhNEU im. S. Kuznetsia, 235.
17. Hurianova, L. S., Klebanova, T. S., Prokopovych, S. V. et. al. (2016). *Prykladna ekonometryka. Chastyna 2*. Kharkiv: KhNEU im. S. Kuznetsia, 252
18. *EViews*. Available at: https://www.eviews.com/home.html
19. *Derzhavna sluzhba statystyky Ukrainy*. Available at: http://www.ukrstat.gov.ua/
20. Klebanova, T. S., Hurianova, L. S., Chahovets, L. O. et. al. (2018). *Biznes-analityka bahatovymirnykh protsesiv*. Kharkiv: KhNEU im. S. Kuznetsia, 272.
21. *StatSoft*. Available at: http://statsoft.ru/
22. *Elektronnii uchebnik StatSoft*. Available at: http://www.statsoft.ru/statportal/tabID__44/DesktopDefault.aspx
23. Dubina, I. N. (2010). *Matematiko-statisticheskie metody v empiricheskikh socialno-ekonomicheskikh issledovaniiakh*. Moscow: Finansy i statistika; INFRA-M, 416.
24. Klebanova, T. S., Kurzenev, V. A., Naumov, V. M. et. al. (2015). *Prohnozuvannia sotsialno-ekonomichnykh protsesiv*. Kharkiv: KhNEU im. S. Kuznetsia, 656.
25. Kalnytskyi, A. Ye., Kopusiak, Ya. F. (2014). Stymuliuvannia zbutu: zakhody ta zasoby, yaki dopomahaiut pry formuvanni marketynhovoi diialnosti pidpryiemstva. *Naukovyi visnyk Uzhhorodskoho universytetu. Seriia: Ekonomika, 1,* 94–97.
26. Saaty, T. L. (2008). Relative measurement and its generalization in decision making why pairwise comparisons are central in mathematics for the measurement of intangible factors the analytic hierarchy/network process. *Revista de La Real Academia de Ciencias Exactas, Fisicas y Naturales. Serie A. Matematicas, 102 (2),* 251–318. doi: http://doi.org/10.1007/bf03191825
27. Dekhtyar, N., Mazorenko, O., Serpukhov, M. (2018). Estimation of Ukraine's foreign trade structure in order to determine the areas of export potential. *Innovative Marketing, 14 (3),* 30–43. doi: http://doi.org/10.21511/im.14(3).2018.04
28. *Expert Choice Academic Program Resources*. Available at: https://www.expertchoice.com/academic-program/resources/

Shapran Evgeniy, *Doctor of Technical Science, Professor, Department of Business, Trade and Products Expertise, National Technical University «Kharkiv Polytechnic Institute», Ukraine, ORCID: http://orcid.org/0000-0002-9236-0905, e-mail: evgen.shapran1948@gmail.com*

Sergienko Olena, *PhD, Associate Professor, Department of Business, Trade and Products Expertise, National Technical University «Kharkiv Polytechnic Institute», Ukraine, ORCID: http://orcid.org/0000-0002-9796-9218, e-mail: serhelenka@gmail.com*

Gaponenko Olga, *PhD, Associate Professor, Department of Business, Trade and Products Expertise, National Technical University «Kharkiv Polytechnic Institute», Ukraine, ORCID: http://orcid.org/0000-0003-4672-3311, e-mail: gaponenko.oe@gmail.com*

Shapran Olena, *PhD, Associate Professor, Department of Economics and Marketing, National Technical University «Kharkiv Polytechnic Institute», Ukraine, ORCID: http://orcid.org/0000-0001-6921-1445, e-mail: elena.shapran82@gmail.com*